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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,894	11/19/2003	Cornelis F. Van Egmond	2003B113	9412

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EXAMINER
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BULLOCK, IN SUK C

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 08/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/716,894		VAN EGMOND ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	In Suk Bullock		1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 May 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6, 9, 12-21, 24, 27-31, 37-40, 58-61 and 67-69 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 12-21, 24, 27-31, 37-40, 58-61 and 67-69 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11/19/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)     | Paper No(s)/Mail Date. ____   |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____  | 6) <input type="checkbox"/> Other: ____                                     |

## DETAILED ACTION

### *Election/Restrictions*

Applicant's election of Group I, claims 1-40 and 58-81, in the reply filed on May 22, 2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### *Response to Amendment*

The amendment to the claims filed on 5/22/2006 does not comply with the requirement of 37 CFR 1.121(c) which requires, "The text of any added subject matter must be shown by underlining the added text." The following text in quotations must be underlined:

**Claim 1(b)**, "by contacting the portion of the methanol with a homologation catalyst selected from the group consisting of potassium oxides, cobalt-molybdenum sulfides, nickel-molybdenum sulfides and potassium carbonates";

**Claim 16(b)**, "containing a catalyst selected from the group consisting of potassium oxides, cobalt-molybdenum sulfides, nickel-molybdenum sulfides and potassium carbonates"; and

**Claim 29(b)**, "selected from the group consisting of potassium oxides, cobalt-molybdenum sulfides, nickel-molybdenum sulfides and potassium carbonates . . . . and forming . . . weight ratio of from 9.0:1.0 to 19.0:1.0".

It is the practice of the Office when the reply appears to be *bona fide*, applicant is given a TIME PERIOD of **ONE (1) MONTH** or **THIRTY (30) DAYS** from the mailing date of a defective amendment notice, whichever is longer, within which to submit an amendment in compliance with 37 CFR 1.121 in order to avoid abandonment. However, in the interest of expediting the prosecution, the amendment to the claims that are presently defective has been considered. It is requested that in response to this Office Action an amendment in compliance with 37 CFR 1.121(c)(2) be submitted.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

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were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-6, 9, 12-21, 24, 27-31, 37-40, 58-61, and 67-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,441,262 to Fung et al. (hereinafter Fung) in view U.S. Patent 4,670,473 to Walker et al. (hereinafter Walker), U.S. Patent 6,114,279 to Fukui et al. (hereinafter Fukui), U.S. Patent 4,849,575 to Lewis (hereinafter Lewis), and U.S. 6,437,208 to Kuechler et al. (hereinafter Kuechler).

The reference to Fung teaches a process for converting an oxygenate feed to an olefin product comprising contacting an alcohol feed containing from about 1-90 wt% methanol and from about 1-99 wt% ethanol, preferably about 1-60 wt% methanol and 40-99 wt% ethanol, and more preferably about 1-30 wt% methanol and about 70-99 wt% ethanol with a molecular sieve catalyst in an alcohol contact zone under conditions effective to produce olefins (e.g., ethylene, propylene). See col. 3, lines 12-39 and col. 4, lines 20-35. The alcohol feed may also contain one or more diluents such as water (col. 4, lines 50-67). The alcohol contacted catalyst is then directed to the oxygenate conversion reactor where it is contacted with at least one oxygenate to produce olefins (col. 11, lines 1-9). The oxygenate, preferably methanol, is added at one more points to the oxygenate conversion reactor and/or to the catalyst feed from the alcohol contact zone (col. 5, lines 1-11). The molecular sieve catalyst is selected from MeAPSOs,

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SAPO-5, SAPO-17, SAPO-18, SAPO-20, SAPO-34, SAPO-44, SAPO-56, the metal containing forms of each thereof, or mixtures thereof. Additional molecular sieve materials (e.g., AEI, CHA, and ZSM-5) can be included as a part of the SAPO catalyst composition or they can be used as separate molecular sieve catalysts in admixture with the SAPO catalyst. See col. 7, lines 12-45 and col. 9, lines 9-26. Conventional separation means are used to separate the desired olefins, such as ethylene and propylene, into individual fractions. These olefins are then polymerized to form polyethylene and polypropylene as desired. See col. 11, lines 21-39 and Figure 1.

Fung does not teach the claimed syngas conversion process to produce methanol and methanol homologation to produce ethanol.

Fukui teaches a catalyst for methanol synthesis comprising copper, zinc, and aluminum oxides (Abstract).

In the art of oxygenate to olefin conversion processes, it is well known to obtain methanol feed from syngas conversion process. A methanol synthesis catalyst comprising copper, zinc, and aluminum oxides is also well known. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Fung by including the well known step of obtaining methanol from syngas conversion process in the presence of a catalyst comprising copper, zinc, and aluminum oxides as taught by Fukui since it is expected that using methanol from any source would yield similar result.

Walker teaches a methanol homologation reaction comprising contacting a portion of methanol derived from syngas synthesis with carbon monoxide and hydrogen

to produce higher alcohols such as ethanol. The homologation reaction is conducted in the presence of a Ni-Mo sulfide catalyst. See Abstract and col. 5, lines 3-5 and 31-43. Water and carbon dioxide are separated from methanol prior to the homologation reaction (col. 7, lines 26-40).

Homologation of methanol to ethanol is also well known in the art. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Fung by including the step of methanol homologation to produce ethanol as taught by Walker because recycling a portion of methanol produced from syngas for homologation is efficient and cost effective means to obtaining desired ethanol product. Furthermore, it is expected that using ethanol from any source in the process of Fung would yield similar result.

With respect to the claimed methanol to ethanol weight ratio, it is within the level of one practicing in the art to select optimum weight ratio of methanol to ethanol depending on desired product yield. Also, Fung teaches that one may vary the desired olefin product by employing greater proportion of the corresponding alcohol in the feed (e.g., greater proportion of ethanol results in additional ethylene in the olefin product).

Lewis teaches a process for producing light olefins from oxygenate conversion comprising methanol production step from syngas, an olefin production step from methanol, and a separation step for recovery of olefins (Abstract and figures). Lewis also teaches that in conventional methanol production by-products such as water and methane, carbon oxide, and hydrogen are separated from methanol (col. 3, lines 23-30).

With respect to the claimed removal of light ends from the combined feedstock, it would be within the level of a skilled artisan to employ a conventional practice in the art of removing light ends from the oxygenate feed as disclosed by Lewis because it is known that these light ends reduce catalytic activity of molecular sieves and produce undesired by-products during the oxygenate to olefin conversion process.

Kuechler is cited to show that carbon oxides are by-products of oxygenate to olefin process (col. 1, lines 18-38). Kuechler also discloses purification of desired products for further use in other chemical processes such as polymerization (col. 14, lines 35-56).

With respect to the claimed separation of carbon monoxide from light olefins and recycling the separated carbon monoxide to the homologation zone, it is known as shown by Kuechler that carbon monoxide is one of the by-products of oxygenate conversion process and to remove carbon monoxide from the light olefin product. Recycling is a conventional practice in the art and, therefore, it would have been obvious to recycle the separated carbon monoxide from the oxygenate conversion process to the homologation zone for purposes of efficiency, reduction in cost, and greater ethanol yield.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct



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from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-40 and 58-81 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-49 and 71-93 of copending Application No. 10/716,685. Although the conflicting claims are not identical, they are not patentably distinct from each other because each set of claims are directed to a process for converting alcohol-containing stream to light olefins in the presence of a molecular sieve catalyst comprising the steps of producing methanol and higher alcohols from syngas.

The instant application recites producing ethanol from methanol homologation while the copending application recites producing fuel alcohol from syngas. It is well known that fuel alcohol includes ethanol and the instant application does not exclude higher alcohols. Moreover, sources of reactants are not critical to the claimed oxygenate conversion process absent a showing to the contrary.

Claims 1-40 and 58-81 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-74 of copending Application No. 10/717,006. Although the conflicting claims are not identical, they are not patentably distinct from each other because each set of claims are directed to a process for converting alcohol-containing stream to light olefins in the presence of a molecular sieve catalyst comprising the steps of producing methanol and higher alcohols from syngas.

Both the instant application and the copending application require methanol and ethanol as a feedstock for the oxygenate conversion process. The difference is only in the ethanol synthesis. However, sources of reactants are not critical to the claimed oxygenate conversion process absent a showing to the contrary.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Response to Arguments***

Applicants' arguments filed May 22, 2006 have been fully considered but they are not persuasive.

Applicants' argument that "Examples II and III (especially Tables III and IV) show that, under the preferred process conditions, the overall production of ethylene and propylene is increased" is not persuasive because the applied prior art reference to Fung teaches the claimed methanol to ethanol weight ratio and temperature range.

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Specifically, Fung teaches an alcohol feed containing from about 1% to about 90% by weight methanol and from 1% to about 99% by weight ethanol, an alcohol contact zone temperature in the range from about 150° C to about 500° C, and an oxygenate conversion operating temperature in the range from about 200° to about 700° C (see col. 3, lines 31-35; col. 5, lines 8-11 and lines 42-45; and col. 10, lines 2-5).

Applicants argue that the Fung process can achieve “high ethylene and propylene content, with a predominant amount of ethylene . . . using a combination of two different reactions zone and two different feeds” which is a different approach from the Applicants’ approach “by making a methanol- and ethanol-containing feed in a manner that can be easily controlled and that can be produced in relatively large quantities”. The argument is not persuasive because, first, Applicants have not excluded the combination of reaction zones taught by Fung to achieve high propylene and ethylene production. Second, the manner of making methanol and ethanol is well known and conventional as shown by the teachings of Fukui and Walker. It is within the level of one practicing in the oxygenate to olefin conversion art to select optimum weight ratio of methanol to ethanol depending on desired product yield. Also, Fung teaches that one may vary the desired olefin product by employing greater proportion of the corresponding alcohol in the feed. Thus, a skilled artisan can control the amount of methanol and ethanol contained in a feed.

With respect to the arguments directed to Walker, Fukui, Lewis, and Kuechler references, the arguments are not persuasive because the references were cited to

supply the missing elements as specifically noted in the rejection above and was not relied upon for the claimed methanol to ethanol weight ratio and reaction temperature.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to In Suk Bullock whose telephone number is 571-272-5954. The examiner can normally be reached on Monday - Friday 6:00-2:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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